

PTO/SB/05 (12/97)

## Attorney Docket No.

18966.0002

Total Pages

31

*First Named Inventor or Application Identifier*

**Courtney Hudson**

*(Only for new nonprovisional applications under 37 C.F.R. 1.53(b))*

Express Mail Label No.

## APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents

ADDRESS TO: Assistant Commissioner for Patents  
Box Applications  
Washington, DC 20231

1. ☒ **Fee Transmittal Form**  
(Submit an original, and a duplicate for fee processing)

2. ☒ **Specification** [Total Pages **[28]**]  
(preferred arrangement set forth below)

  - Descriptive title of the invention
  - Cross References to Related Applications
  - Statement Regarding Fed sponsored R & D
  - Reference to Microfiche Appendix
  - Background of the Invention
  - Brief Summary of the invention
  - Brief Description of the Drawings (if filed)
  - Detailed Description
  - Claim(s)
  - Abstract of the Disclosure

3. ☒ **Drawing(s) [35 USC 113]** [Total Pages **[3]**]

4. **Oath or Declaration** [Total Pages **[ ]**]

  - a. ☐ Newly executed (original or copy)
  - b. ☐ Copy from a prior application (37 CFR 1.63(d))  
(for continuation/divisional with Box 17 completed)
  - ☐ **DELETION OF INVENTOR(S)**  
Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b)

5. ☐ **Incorporation By Reference (useable if Box 4b is checked)** The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

6. ☐ **Microfiche Computer Program (Appendix)**

7. **Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)**

  - a. ☐ Computer Readable Copy
  - b. ☐ Paper Copy (identical to computer copy)
  - c. ☐ Statement verifying identity of above copies

## ACCOMPANYING APPLICATION PARTS

8. ☐ Assignment Papers (cover sheet & document(s))
9. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney
10. ☐ English Translation Document *(if applicable)*
11. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Return Receipt Postcard (MPEP 503)  
*(Should be specifically itemized)*
14. ☐ Small Entity ☐ Statement filed in prior application.  
Statement(s) Status still proper and desired
15. ☐ Certified Copy of Priority Document(s)  
*(if foreign priority is claimed)*
16. ☐ Other:

17. If a **CONTINUING APPLICATION**, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No. \_\_\_\_\_

## 18. CORRESPONDENCE ADDRESS

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## FEE TRANSMITTAL

## Complete If Known

Application Number

Filing Date

October 31, 2000

First Named Inventor

Courtney Hudson

Group Art Unit

Examiner Name

TOTAL AMOUNT OF PAYMENT

(\$ ) 0.00

Attorney Docket Number

18966.0002

## METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fee and credit any over payments to☐ Deposit Account

Number 19-5127 (Referecing order no. 18966 0002)

Deposit Account Name Swidler Berlin Shereff Friedmann, LLP

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17☐ Charge the Fee Set in 37 CFR 1.18 at the Mailing of the Notice of Allowance, 37 CFR 1.311(b)

2. XX Payment will be submitted with Decl &amp; POA

Check ☐ Money Order ☐ Deposit Account Authorization

## FEE CALCULATION (fees effective 10/01/97)

## 1. FILING FEE

Large Fee Code	Entity Fee (\$)	Small Fee Code	Entity Fee (\$)	Fee Description	Fee Paid
101	690	201	345	Utility filing fee	710
106	330	206	165	Design filing fee	
107	540	207	270	Plant filing fee	
108	790	208	395	Reissue filing fee	
114	150	214	75	Provisional filing fee	

SUBTOTAL (1)

\$710.00

## 2. CLAIMS

Total Claims [24] - 20 = [4] X [18] = [72]

Independent Claims [3] - 3 = [0] X [80] = [0]

Multiple Dependent Claims [0] [ ] X [ ] = [ ]

Large Fee Code	Entity Fee (\$)	Small Fee Code	Entity Fee (\$)	Fee Description
103	22	203	11	Claims in excess of 20
102	82	202	41	Independent claims in excess of 3
104	270	204	135	Multiple dependent claim
109	82	209	41	Reissue independent claims over original patent
110	22	210	11	Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) [\$72.00]

## FEE CALCULATION (continued)

## ADDITIONAL FEES

Large Fee Code	Entity Fee (\$)	Small Fee Code	Entity Fee (\$)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	
139	130	239	65	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,790*	113	1,790*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for response within first month	
116	400	216	200	Extension for response within second month	
117	950	217	475	Extension for response within third month	
118	1,510	218	755	Extension for response within the fourth month	
128	2,060	228	1,030	Extension for response within the fifth month	
129	310	219	155	Notice of Appeal	
120	310	220	155	Filing a brief in support of an appeal	
121	270	221	135	Request for oral hearing	
140	110	240	55	Petition to revive unavoidably abandoned application	
141	1,320	241	660	Petition to revive unintentionally abandoned application	
142	1,320	242	660	Utility issue fee (or reissue)	
143	450	243	225	Design issue fee	
144	670	244	335	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Petitions related to provisional applications	
126	240	126	240	Submission of Information Disclosure Statement	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	790	246	395	Filing a submission after final rejection (37 CFR 1.129(a))	
149	790	249	790	For each additional invention to be examined (37 CFR 1.129(b))	

Other fee (specify) \_\_\_\_\_

SUBTOTAL (3)

\* Reduced by Basic Filing Fee Paid

OFFICE OF THE COMPTROLLER OF THE PATENT AND TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: :  
Courtney Hudson et al. : Attorney Docket 18966.0002  
Application No. :  
Filed: October 31, 2000 :  
For: SYSTEM AND METHOD FOR MATCHING PATIENTS WITH  
CLINICAL TRIALS



TRANSMITTAL LETTER

Commissioner for Patents  
Washington, D.C. 20231

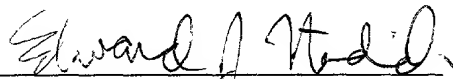
Sir:

Transmitted herewith are the following documents for filing in the U.S. Patent and Trademark Office:

1. U.S. Patent Application;
2. Utility Patent Application Transmittal and;
2. Fee Transmittal.

The Commissioner is hereby authorized to charge any insufficient fees or credit any overpayment to Deposit Account No. 19-5127 referencing 18966.0002.

Respectfully submitted,  
Swidler Berlin Shereff Friedman, LLP

  
By: Edward J. Naigich  
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Dated: October 31, 2000

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# U.S. PATENT APPLICATION

**FOR:**

# SYSTEM AND METHOD FOR MATCHING PATIENTS WITH CLINICAL TRIALS

**Inventors:**  
**Courtney Hudson**  
**Glenn Rice**

# **SYSTEM AND METHOD FOR MATCHING PATIENTS WITH CLINICAL TRIALS**

## **FIELD OF THE INVENTION:**

5           The present invention relates to a system and method for matching patients with clinical trials. More specifically, the present invention relates to a system and method for quickly and efficiently matching patients with clinical trials and clinical trial sites over a computer network.

## **BACKGROUND OF THE INVENTION:**

Many companies sponsor clinical trials for new drugs, medical devices, therapies, or treatment programs. Typical clinical trial sponsors include pharmaceutical companies, biotech companies, medical device companies, clinical research organizations (CRO's), and site management organizations  
15 (SMO's). Clinical trials are often an important step before obtaining FDA approval for particular drugs.

Patients who have been diagnosed with a disease are often in need of finding appropriate clinical trials for new drugs, medical devices, or treatments to treat their disease. Patients with serious diseases may only have weeks or months  
20 to live, and thus the ability to find available clinical trials and information about those trials quickly and efficiently is invaluable. Unfortunately today, there is no effective system for quickly matching patients with clinical trials. Doctors are often not aware of all the clinical trials that are being performed in different geographic regions. Clinical trial sponsors have difficulty finding suitable patients  
25 for their trials because there is a lack of up-to-date listings of clinical trials, patients are geographically dispersed, many clinical trials require screening large segments of the population, and patients lack insurance coverage. Additionally,

patients seeking on their own to find clinical trials which may help them often suffer from consumer confusion with regard to medical terminology and protocol information, and thus have a difficult time identifying appropriate clinical trials.

Clinical trial sponsors are also hurt by this problem, since the inability to quickly find acceptable patients to enroll in their trials delays development of their new drugs or devices and delays FDA approval. What is needed is a method of quickly and efficiently matching qualifying patients with appropriate clinical trials. What is also needed is a system that can match patient medical profiles and patient characteristics with clinical trial acceptance criteria for a wide range of clinical trials in dispersed geographic areas. What is also needed is a source of comprehensive information about diseases, drugs, medical devices, and clinical trials to provide patients, family, friends and health care professionals the necessary information to make informed decisions about which clinical trials are useful for treating various conditions, and other related information such as risks, benefits, insurance coverage, and other similar information.

#### **SUMMARY OF THE INVENTION:**

The present invention is a system and method for matching patients with clinical trials and trial sites, prequalifying patients for clinical trials and trial sites, and providing information to patients to allow them to inform themselves about available clinical trials and trial sites. The method of the present invention comprises receiving patient profile information for a patient at a server connected to a computer network such as the Internet. The patient profile information is submitted by a user at a terminal connected to the network. A server compares the patient profile information with acceptance criteria (including geographic location) for clinical trials and trial sites stored in a database. The server

determines whether the patient qualifies for any of the clinical trials, and notifies the user whether the patient has prequalified for any clinical trials.

The patient's profile is built by asking the user a series of questions and then creating the patient profile based on the user's responses. The questions can include static and dynamic questions. The user is also asked a series of questions targeted to a specific clinical trial or trial site after determining that the patient meets the preliminary acceptance criteria for the specific clinical trial or trial site. The final determination of whether the user prequalifies is based on the user's response to the targeted questions.

When the user is provided with a question, the user is also provided with a set of answer options. The user responds to the question by choosing one or more of the answer options. Alternatively, the user can type in an answer to the question.

Once the user has prequalified for a clinical trial/trial site, the user is provided with an application. The user fills out the application and can submit the application on-line. The application and the patient's medical profile are sent to the appropriate trial site. The patient's application and medical profile do not include the patient's name, social security number or other identifying information. This protects the patient's privacy. If the patient is accepted by the trial site, the patient is notified and provided with trial site contact information. The patient can contact the trial site to enroll in the clinical trial.

#### **BRIEF DESCRIPTION OF THE DRAWINGS:**

FIG. 1 depicts a block diagram illustrating the system of the present invention.

FIG. 2 depicts a flowchart illustrating a method of matching a patient with available clinical trial sites and prequalifying patients for clinical trials.



FIG. 3 depicts a block diagram illustrating some exemplary links between various records in data storage device 120.

**DETAILED DESCRIPTION OF THE INVENTION:**

5           The system of the present invention brings patients together with clinical trials by allowing patients, health care professionals, clinical trial sponsors, and clinical trial investigators to access a centralized database. The system matches patient profile information with clinical trial acceptance criteria to determine whether a patient prequalifies for particular trials. Once the system of the present invention determines that a patient prequalifies for a particular clinical trial site, 10 the patient is then placed in contact with the clinical trial site so that the patient can enroll in the clinical trial. The clinical trial site may require that the patient undergo medical testing or answer additional questions before enrollment is permitted. Thus, the system of the present invention performs the process of 15 “prescreening” or “prequalifying.”

In a preferred embodiment of the invention, the system resides on a server on the Internet. Users of the system can conveniently access the system over the World Wide Web. Patients and trial sites can access the system by visiting the EmergingMed.com web site.

20           In addition to matching patients with clinical trials, the server of the present invention also allows patients to search and view information about aspects of various diseases, drugs, medical devices, clinical trials, treatment programs, medical news, research and other similar sources of medical information. Patients who visit the EmergingMed.com web site can get educated 25 on the disease for which they have been diagnosed and the available clinical trials. Health care professionals can also access the EmergingMed.com web site to learn the latest medical information. They can also learn about what various clinical

trials are available for that disease, which trials are already closed (i.e. the sponsoring companies are not taking any more patients), and which trials are still open and taking patients.

Clinical trial sponsors include pharmaceutical companies, biotech  
 5 companies, medical device companies, clinical research organizations (CRO's),  
 and site management organizations (SMO's). The EmergingMed.com web site  
 benefits clinical trial sponsors by allowing them to quickly find, prescreen and  
 recruit suitable patients for their clinical trials. The EmergingMed.com web site  
 thus allows the trial sponsors to accelerate the conduct and completion of their  
 10 clinical trials in order to obtain FDA approval or demonstrate additional  
 efficiency for particular drugs or devices. By accelerating the conduct and  
 completion of clinical trials, these companies can effectively reduce costs and  
 speed up time to market.

The individual or group of individuals who actually conduct a clinical trial  
 15 for a sponsor will be referred to herein as an "investigator." The investigator or  
 investigators conduct clinical trials at clinical trial sites. For example, a drug  
 company is interested in conducting trials for a new drug which it has just  
 developed for fighting cancer. A doctor is conducting a clinical trial for the drug  
 company at New York Hospital in New York. The drug company is the clinical  
 20 trial sponsor. The doctor is the investigator. New York Hospital is the clinical  
 trial site.

FIG. 1 depicts a block diagram illustrating the system of the present  
 invention. An EmergingMed.com server 102 is connected to a network 116.  
 Network 116 can be any network connecting computers such as the Internet.  
 25 Sponsors of clinical trials utilize a clinical trial sponsor terminal 104 to access  
 EmergingMed.com server 102 and to communicate with other terminals  
 connected to network 116. Clinical trial sponsor terminal 104 is running browser

program 106 which allows terminal to access remote servers and communicate with other terminals via network 116.

Patients and other individuals can access EmergingMed.com server 102 by using patient terminal 108 which is running browser program 110. Healthcare professionals can access EmergingMed.com server 102 by using health care professional terminal 112 running browser program 114. Clinical trial investigators can access EmergingMed.com server 102 by using clinical trial investigator terminal 105. Other individuals can similarly access EmergingMed.com server 102 by using any terminal connected to network 116.

EmergingMed.com server 102 includes a CPU 122 which is running a program which operates the method of the present invention. CPU 122 accesses RAM 118, ROM 120, and data storage device 124. Data storage device 124 can be any magnetic or optical media, or any other medium for storing electronic data. As will be understood by one of skill in the art, EmergingMed.com server 102 can comprise multiple servers working together, and data storage device 124 can similarly comprise multiple storage devices.

Data storage device 124 contains a database 142. Database 142 contains information organized into records. Some exemplary records are shown in FIG. 1. Disease/sub-disease records 126 contain information related to specific diseases. These records are organized both by disease and sub-disease. An example of a disease is "cancer" and an example of a sub-disease is "skin cancer." Disease/sub-disease records 126 contain information about the disease such as description of the disease, symptoms, treatment, history, and other pertinent information. Each disease/sub-disease record 126 also includes links to other related records in database 142 such as drug records 128 (e.g. drugs used to treat the disease), content records 130, clinical trial site records 132, question records



Device records 136 contain information about various medical devices such as the device manufacturer name, the diseases and conditions treated, instructions for using the device, warnings, and other pertinent device information. Device records 136 contain links to other records in database 142.

User registration records 140 contain user information about the various users authorized to access EmergingMed.com server 102. User registration records 140 contain information such as user name, user ID number, login name, password, access privileges, customized user preferences, mail accounts, links to patient profiles, and any other similar user information.

Patient profile records 138 contain various types of medical information about patients including their gender, age, medical histories, diseases, symptoms, and any other relevant medical information. Patient profile records are created by asking the patient a series of questions. The responses are used to build the patient's profile. The responses can be entered by a health care professional or by the patients themselves.

In a preferred embodiment of the invention, patient profile records 138 do not contain the user's name, but instead only contain the user's ID number. In other words, the patient's medical information is kept separate from the patient's identifying information. This maintains the user's medical privacy and

anonymity. As will be described in more detail with respect to FIG. 2, every patient is assigned a user ID number. The user's name and identifying information is stored in the user's registration record 140 along with the user's ID number. The patient's medical information is stored in a patient profile record 5 138 along with the patient's user ID number. In this way, the patient's profile record 138 can be sent to a third party without revealing the patient's identity to the third party. In this way, EmergingMed.com has access to the patient's identifying information, but third parties do not. Additional records can be added to database 142 for various other purposes. Also, the organization of the records 10 shown in FIG. 1 is by example only, and different organizations and groupings of records is possible.

FIG. 2 depicts a flowchart illustrating a method of matching a patient with available clinical trials. In step 200, a user registers with the EmergingMed.com web site. The user could be a patient, a health care professional such as a doctor, 15 a representative from a clinical trial sponsor, an investigator, a representative from a health care facility or clinical trial site, or any other individual or entity involved in the clinical trial process.

When a user registers, the user selects a user name and a password. The user can also submit an e-mail address. This information is stored in a user 20 registration record 140. The user is also assigned a user ID number. This user ID number is attached to the user's profile records/medical information in order to keep the user-patient's identity anonymous.

In step 201, a user interested in searching for available clinical trials accesses the EmergingMed.com web site by entering an appropriate URL such as 25 <http://www.emergingmed.com>. The user then clicks on a link or a series of links that directs the user to the clinical trial search process.

One type of user that might be interested in searching for an available clinical trial is simply a patient or a relative or friend of a patient. The user could also be a health care professional such as the patient's doctor.

5 The first step in finding appropriate clinical trials is creating a patient profile for the patient. The patient profile will contain the patient's medical information and any of the patient's characteristics that would be useful in determining whether a patient was suitable for a particular clinical trial.

10 The patient profile is created by asking the user a series of questions. In step 202, the user is asked a series of "static" questions. Static questions are a series of pre-defined questions that are asked about every patient. Examples of static questions include the patient's gender, age, height, weight, name of disease, name of sub-disease, smoker (yes/no), willing to travel (yes/no), and any other pertinent medical or patient information. The user can select a disease and sub-disease from a set of menus. For example, the user could select the disease  
15 "cancer" and the sub-disease "skin cancer." Optionally, the user can select the types of trials for which he or she is interested. For example, the user can select the trial sponsor type, trial modality, trial type of study, and drug or compound name.

20 Note that the "user" is not necessarily the "patient." As an example, a patient's doctor could be the "user" who accesses EmergingMed.com. The patient's doctor then enters information about the patient to build the patient profile. Using this example, the patient's doctor is doing the searching for clinical trials on behalf of the patient. In step 204, the user is asked a series of "dynamic" questions about the patient. The dynamic questions are questions  
25 which are selected based on the user's previous answers to other questions. Many of the dynamic questions will be questions which are unique to the specific selected disease and sub-disease.

When the user is presented with questions, the user is also presented with a group of answer options. The user can click on one or more of the answer options to respond to the question (some questions only allow one answer option to be selected, whereas other questions allow multiple answer options to be selected).

Preferably the questions asked to the patient, and the answer options provided to the patient, are such that a computer software program can evaluate and score the answers to the questions, rather than having a human being evaluate the answers. For example, one type of question that is easy to evaluate and/or score by a computer program is a question that allows the patient to choose one or more answers from a set of discrete multiple-choice answers. This type of question is very easy for a computer to evaluate and/or assign a score. As another example, if the patient is required to enter a numerical number, such as enter the patient's blood pressure, height or weight, this is also very easy for a computer to evaluate and/or assign a score. However, if the patient were asked "Please describe your pain" and then the patient were allowed to enter a text message, then a computer would have a difficult time evaluating this answer. A human would have to read the answer and evaluate the answer.

Some example questions are presented as follows:

- Please select any or all prior cancer treatments (followed by a list of treatments, patients can click on any treatments they have had).
- How many times did you have surgery?
- Please select all dates that correspond to your surgeries (followed by a list of dates that the patient can click on).
- Select all surgical procedures performed to date.
- Was your surgery followed by (followed by a list of choices)?.
- Was your surgery proceeded by (followed by a list of choices)?



- How many chemotherapy regimes have you received?
- Please select all dates that correspond to your chemotreatment.
- Which organs are affected by malignancies at this time?
- What is the stage of cancer at the time of diagnosis?

5           The user can be asked different levels of dynamic questions. For example, depending on the user's answer to a particular question, the user can be asked a follow-up dynamic question. If the user answers this question in a certain way, the user can be asked another follow-up question to the follow-up question. In this way the user is automatically steered through the process of building a patient

10       profile. As an example, if the user selects "Lung Cancer" as a disease, the user could be asked "Are you a smoker?" If the user selects "YES", then the user could be asked: "How many cigarettes a day do you smoke?." If the user selects "More than five", then the user could be asked "How many years have you smoked?" In this way the user is steered through the process of building a patient profile.

15           Once all the questions have been answered, static and dynamic, a patient profile is created. The patient may save the profile for later use. The patient profiles is stored in patient profile records 138 in database 142. In step 206, EmergingMed.com server 102 begins a process of determining whether the patient's profile matches any available ongoing clinical trials by comparing the

20       patient's profile with acceptance criteria for available on-going clinical trials.

          As explained previously, the answers requested from the users are suitable for a computer software program to score and evaluate. Thus, a computer program process can automatically determine whether the patient prequalifies. This eliminates the need to have people review the patient's profile to determine

25       prequalification.

          In step 208, the system makes a preliminary determination of whether the patient qualifies for any available on-going clinical trials. The trial matching is

preferably done at the trial site level, not the trial level. For example, a drug manufacturer may be sponsoring a clinical trial for a new drug at many trial sites around the country. The patient's profile is compared to each individual trial site to determine whether the patient prequalifies for that individual trial site.

- 5 Different trial sites for the same trial could have different acceptance criteria. For example, a particular trial site may be limited to patients living within twenty miles of the trial site.

One method that can be used to determine whether a patient prequalifies for a particular trial site, is that the patient prequalifies for a trial site only if the patient meets all of the acceptance criteria for that specific trial. For example, a trial site could require that a patient must be female between the ages of 30-40 who has breast cancer, does not drink alcohol, and lives within twenty five miles of New York City. If the patient meets all of these criteria, then the patient will be prequalified for that trial site.

- 15 An alternative method of prequalifying patients is to calculate a score based on the answers given by the patient. For example, the score could simply be the number of criteria met by the patient. More complicated algorithms could also be used to generate a score. For example, the score could include the patient's blood pressure divided by two, plus three times the patient's age, and so on. The patient would then qualify only if the score exceeded or was less than a predetermined threshold or within certain predetermined threshold limits. There can also exist a combination of a score threshold, and criteria which must be satisfied in order to qualify. For example, in order to qualify for a particular trial site, patients could be required to be female, over 35, and have a score over 253 where the score is based on a number of other factors.

Some examples of acceptance criteria that can be used include: the patient must be within a certain age range, must be female, must live within a certain



scaleable and updateable by EmergingMed.com 102 personnel. In some instances, other parties such as clinical trial sponsors and investigators can be given access privileges (as described above) to enter data such as acceptance criteria, questions, answers, etc. The static and dynamic questions asked to  
5 patients to build their patient profile can be updated and/or supplemented frequently to reflect new medical developments, trial site selection criteria, new clinical trials, amendments to clinical trial protocols, and other developments.

Users can also be informed of the number of trials for their disease for which the patient does not qualify, or how many trials are currently closed, or  
10 potentially if there is a waiting list available for which the patients can sign up. For example, the user could be informed that for skin cancer there are currently ten trials available and the patient qualifies for three of those ten.

After the system has made a preliminary determination of whether the patient prequalifies for any clinical trials, in step 210 the system can provide  
15 targeted questions specific to each clinical trial for which the patient has preliminarily qualified. Once the system has received responses to these targeted questions, then in step 212 the system makes a final determination as to whether the patient prequalifies for any of the clinical trials based on the user's responses to the targeted questions.

20 In step 214, if the patient prequalifies for any clinical trials, the patient is then provided with an application to fill out. The patient is allowed to submit an-line application for each trial site for which he or she qualifies. The patient's applications and medical profile are submitted online to EmergingMed.com server 102. Alternatively, the patients could submit their applications and profiles by  
25 other methods such as by mail or by facsimile.

In step 216, the patient's applications are forwarded along with the patient's medical profile to the appropriate trial site investigators or designated

staff. The applications can be submitted to the trial site online, or alternatively, by other methods such as mail or facsimile. As described previously, the patient's medical profile and application preferably does not contain the patient's name, social security, and other identifying information. The patient's medical profile and application only include a patient ID number. In this way, the patient's privacy is protected in accordance with government regulated confidentiality standards. A copy of the patient's application/profile, a summary of the patient's application/profile, or a notification could optionally be sent to the trial sponsor in addition to the trial site.

10 As an alternative to submitting applications to the trial sites via  
EmergingMed.com web server 102, the applications could alternatively be  
submitted directly by the patient to the trial site investigators or staff. However, it  
may be preferable to send all information to the trial site via EmergingMed.com  
server 102 in order to maintain the privacy of patients' identity.

Another method of sending the patient's application and profile to the trial site investigator is as follows. The trial site investigator or contact person has a designated "mailbox" in a message center on EmergingMed.com server 102. The patient therefore sends a message to the investigator/contact person containing the application and profile. This message is then stored on the EmergingMed.com server 102 and can be retrieved by the investigator/contact person.

In step 220, the patient is notified whether he or she has been successfully prescreened or rejected for the clinical trial site which the patient has applied.

The patient can be telephoned or e-mailed or contacted by other means.

Alternatively, the patient can access the EmergingMed.com web site and check  
25 his or her status. If the patient has successfully prequalified for a clinical trial  
site, the patient can be provided with contact information at the trial site. The  
patient can then contact the appropriate person at the trial site (either through a

message left in the EmergingMed.com server 102 message center or through other contact means) to inquire about enrolling in the clinical trial site or to seek further information. The clinical trial site may then require that the patient undergo further medical testing or answer further questions before the patient is enrolled in a clinical trial.

Another feature provided by EmergingMed.com server 102 is to allow users to search and obtain medical information about diseases, drugs, medical devices, treatments, clinical trials, and any other pertinent information. In this way, patients and health care professionals can educate themselves about a disease, standard or experimental treatments, and ongoing clinical trials before deciding whether to participate in any clinical trials. This process is enhanced by providing many links between the various records shown in database 142 in FIG. 1.

The method just described and shown in FIG. 2 is a method of matching patients with clinical trial sites. The system of the present invention can also perform other types of matching such as:

- patient to patient matching
- trial sponsor to investigator matching
- investigator to trial site matching

Patient to patient matching involves matching one patient with another patient based on their patient profiles. For example, a patient with a particular disease could be matched with other patients with a similar disease. This allows the patients to automatically form a support group. A patient could be provided e-mail addresses of other matching patients so that they can be contacted. Each patient could be provided with an anonymous e-mail name so that the patient privacy can be protected. Alternatively, messages could be addressed to a user ID number.

Trial sponsor to investigator matching involves matching a clinical trial sponsor with an investigator suitable for conducting the trial. For example, a drug company might be interested in finding a researcher with 20 years of experience researching breast cancer treatment in the Milwaukee area. Investigator to trial site matching involves matching investigators with trial sites that are looking for investigators with particular qualifications. What all of these methods share in common is that the EmergingMed.com server 102 finds matches between matching parties and performs an initial layer of prequalification or prescreening before bringing the parties together.

10           FIG. 3 depicts a block diagram illustrating some exemplary links between various records in data storage device 120. These links allow a user to navigate the web site and efficiently find medical information relevant to their particular medical condition. The user can also search for relevant information by entering keyword queries. For example, a user searching for particular information about a particular disease would enter the name of a disease and sub-disease such as  
15           “cancer/skin cancer.” This would retrieve disease/sub-disease record 300 for skin cancer. Disease/sub-disease record 300 would contain information about skin cancer which would be provided to the user. When the user accesses disease/sub-disease record 300, the user is provided with all of the information contained in  
20           record 300 as well as links to records 302, 304, 305, and 306. The user can then click on one of these links to access the linked record.

          Disease/sub-disease record 300 contains links to related drug/device records 302. These drug/device records are associated with drugs and medical devices used to treat the disease/sub-disease associated with disease/sub-disease  
25           record 300. The drug/device records 302 contain information about their associated drug or device such as instructions for taking a drug or using a medical device, warnings, side effects, and similar information.

Disease/sub-disease record 300 also contains links to content records 304. Content records 304 contain additional information about the disease/sub-disease such as related news and journal articles, standard therapies, therapies in development, case studies, alternative treatments, and frequently asked questions.

5 Disease/sub-disease records 300 also contain links to clinical trial records 304. Clinical trial records 304 contain information about various clinical trials which address the specific disease/sub-disease such as the clinical trial sponsor type, trial site locations, acceptance criteria, number of people admitted, and so on. Disease/sub-disease records 300 also contain links to related question records 10 306. These are questions that are asked to users who are seeking to qualify for clinical trials. These questions are asked in step 204 in FIG. 2.

FIG. 3B shows another set of links emanating from drug or device record 308. A user can access a drug or device record 308 to find out information about that drug or device. The user will be presented with links to related content 15 records 312 which provide content related to that drug or device. The user will also be presented with links to related clinical trial records 314. The user will also be presented with links to related disease/sub-diseases records 316.

FIG. 3C shows another set of links emanating from content record 318. Content record 318 could be a news or journal article, or some other piece of 20 information. Content record 318 contains links to related drug records 320, related clinical trial records 322, and related disease/sub-disease records 324.

FIG. 3D depicts another set of links emanating from clinical trial record 326. Clinical trial record 326 contains links to related drug records 328, related content records 330, and related disease/subdisease records 332. Clinical trial 25 record 326 also contains links to related question records 334. These questions are asked to users in step 210 of FIG. 2 to determine if they qualify for the specific clinical trial.



When a user visits DrugCompany.com, the user is provided with a link or group of links which allows the user to search for clinical trials. There are various methods that can be used to allow DrugCompany.com to interface with

EmergingMed.com server 102. In a first method, the DrugCompany.com server  
10 relays all of the data entered by the user to the EmergingMed.com server 102.

The DrugCompany.com server then receives the data sent by EmergingMed.com server 102 and forwards it to the patient. DrugCompany.com thus acts as an intermediary or proxy server for the EmergingMed.com server. Another method is to provide DrugCompany.com with all of the software necessary to ask the patient's questions to build a patient profile. DrugCompany.com could then relay the information to EmergingMed.com server 102. EmergingMed.com server 102 could search database 124 and forward the results to DrugCompany.com. A variety of other well known methods could be used to access EmergingMed.com server 102 via DrugCompany.com.

20 A patient who performs trial matching and prequalification at DrugCompany.com can also be limited to searching only subsets of the total available clinical trial sites. For example, the users at DrugCompany.com could be limited to only searching for clinical trials sponsored by DrugCompany.com.

Figure 1 consists of 12 histograms arranged in a single row. Each histogram represents the distribution of the number of non-zero elements in the vector  $x$  for a specific value of  $n$ . The x-axis for all histograms is labeled 'Number of non-zero elements' and ranges from 0 to 120. The y-axis is labeled 'Frequency' and ranges from 0 to 100. The histograms are labeled with  $n$  values: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, and 120. For  $n=10$ , the distribution is centered around 60. As  $n$  increases, the distribution shifts to the right, and the peak frequency decreases. For example, for  $n=120$ , the distribution is centered around 120, and the frequency is very low.

**CLAIMS:**

- 1 1. A method for matching patients with clinical trials, comprising:
  - 2 receiving patient profile information for a patient at a server connected to
  - 3 a computer network, the patient profile information submitted by a user at a
  - 4 terminal connected to the network;
  - 5 comparing the patient profile information with acceptance criteria for
  - 6 clinical trials stored in a database, the comparison performed by the server; and
  - 7 determining whether the patient prequalifies for any of the clinical trials;
  - 8 and
  - 9 notifying the user whether the patient has prequalified for any clinical
  - 10 trial.
- 1 2. The method of claim 1, wherein the steps of comparing, determining, and
  - 2 notifying comprise:
    - 3 comparing the patient profile information with acceptance criteria for
    - 4 clinical trial sites stored in a database, the comparison performed by the server;
    - 5 determining whether the patient prequalifies for any of the clinical trial
    - 6 sites; and
    - 7 notifying the user whether the patient has prequalified for any clinical trial
    - 8 sites.
- 1 3. The method of claim 2, further including providing the user with instructions
  - 2 for enrolling in the clinical trial for which the user has prequalified.
- 1 4. The method of claim 2, further including:
  - 2 asking the user a plurality of questions; and

5. The method of claim 4, wherein the step of asking the user a plurality of questions includes:

- asking the user one or more static questions;
- asking the user one or more dynamic questions which are selected based on the user's responses to other static and dynamic questions; and
- creating a patient profile based on the responses to the static and dynamic questions.

1     6. The method of claim 3, further including:  
2             asking the user a series of questions targeted to a specific clinical trial site  
3     after determining that a patient meets preliminary acceptance criteria for the  
4     specific clinical trial; and  
5             determining whether the user prequalifies for the specific clinical trial  
6     based on the user's response to the targeted questions.

1 7. The method of claim 6, wherein the static questions, dynamic questions, and  
2 targeted questions are provided with a plurality of answer options, and the user  
3 may select one or more answer options in order to answer the questions.

1     8. The method of claim 7, wherein the user is required to submit an answer in a  
2     specified format, the specified format being suitable for evaluation by a computer  
3     program process.

- 1 9. The method of claim 8, further including:  
2 updating the static questions, dynamic questions, or answer options.
- 1 10. The method of claim 1, wherein the network is the Internet.
- 1 11. The method of claim 1, wherein the user is provided with an application to  
2 submit for a clinical trial for which the patient has prequalified.
- 1 12. The method of claim 11, wherein the application is filled out by the user and  
2 submitted on-line to the server.
- 1 13. The method of claim 12, wherein the application is forwarded to the clinical  
2 trial site.
- 1 14. The method of claim 13, wherein the patient profile is forwarded to the  
2 clinical trial site with the application.
- 1 15. The method of claim 14, wherein the application and patient profile  
2 forwarded to the trial site includes a patient ID number, but does not include the  
3 patient's name to protect the privacy of the patient.
- 1 16. The method of claim 15, further including:  
2 notifying the clinical trial sponsor when the user submits an application to  
3 the clinical trial site.

1 17. The method of claim 1, wherein the user is provided with a search engine that  
2 allows the user to search for medical information before selecting a clinical trial.

1 18. The method of claim 1, wherein the acceptance criteria includes geographic  
2 location.

1 19. A system for matching patients with clinical trials, comprising:  
2 a server connected to a network;  
3 a data storage device included in the server; and  
4 a database located in the data storage device, the database storing patient  
5 profile information for a patient and acceptance criteria for a plurality of clinical  
6 trials;  
7 the server comparing the patient profile information with the  
8 acceptance criteria for the clinical trials stored in the  
9 database, determining whether the patient prequalifies for  
10 any of the clinical trials, and notifying a user whether the  
11 patient has prequalified for any clinical trials.

1 20. The system of claim 19, wherein the database contains at least one of:  
2 a) disease/sub-disease records;  
3 b) drug records;  
4 c) content records;  
5 d) clinical trial records;  
6 e) question records;  
7 f) device records;  
8 g) patient profile records;

- 9 g) user registration records; and
- 10 g) trial site records.

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1 21. The system of claim 20, wherein a record in the database contains links to  
2 other related records.

1 22. The system of claim 20, wherein the server transmits a plurality of questions  
2 to the user over the network, the server also transmits a plurality of answer  
3 choices for each question, the server receives responses from the user, and the  
4 server builds a patient profile based on the responses.

1 23. The system of claim 19, wherein the server retrieves a disease/sub-disease  
2 record corresponding to a disease/sub-disease entered by the user, the disease/-  
3 sub-disease record containing links to question records, the server retrieving the  
4 question records to access questions to be provided to the user.

1 24. Computer executable software code stored on a computer readable medium,  
2 performing a method for matching patients with clinical trials, comprising:  
3 receiving patient profile information for a patient at a server connected to  
4 a computer network, the patient profile information submitted by a user at a  
5 terminal connected to the network;  
6 comparing the patient profile information with acceptance criteria for  
7 clinical trials stored in a database, the comparison performed by the server; and  
8 determining whether the patient prequalifies for any of the clinical trials;  
9 and

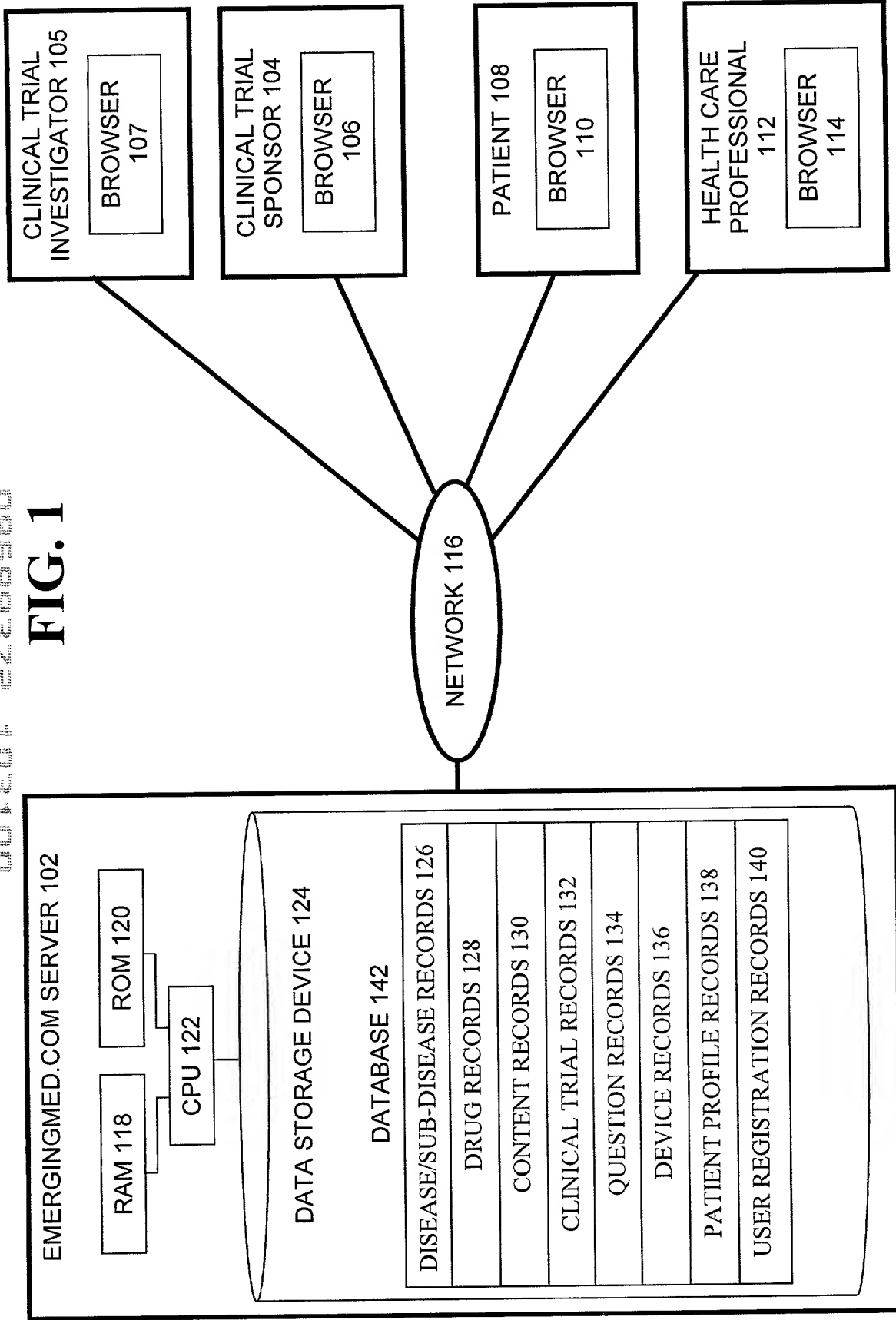
10 notifying the user whether the patient has prequalified for any clinical  
11 trials.  
12

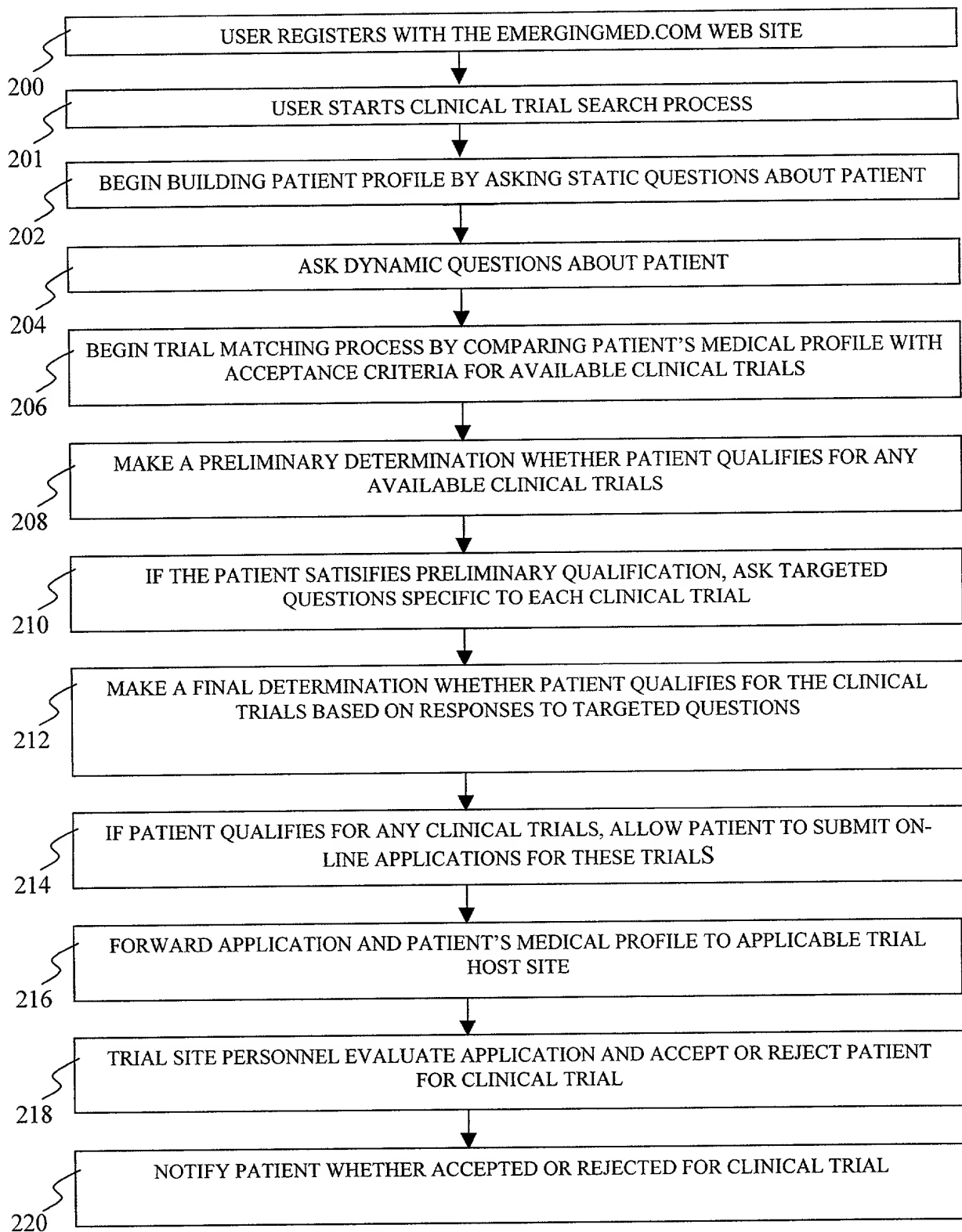


**ABSTRACT:**

A system and method for matching patients with clinical trials and particular trial sites, prequalifying patients for clinical trials and trial sites, and providing information to patients to allow them to inform themselves about available clinical trials and trial sites. The method comprises receiving patient profile information for a patient at a server connected to a computer network, the patient profile information submitted by a user at a terminal connected to the network, comparing the patient profile information with acceptance criteria for clinical trials stored in a database, the comparison performed by the server, determining whether the patient prequalifies for any of the clinical trials, and notifying the user and the trial site whether the patient has prequalified for any clinical trials.

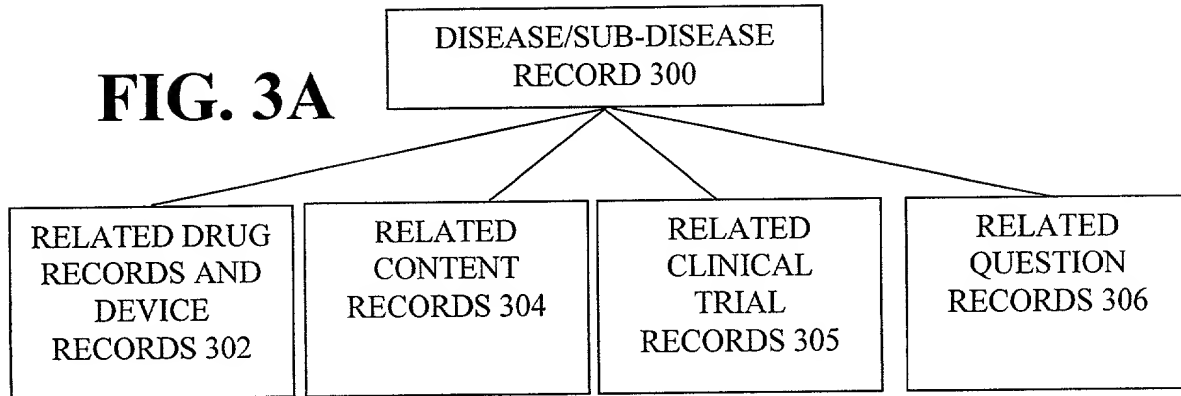
FIG. 1



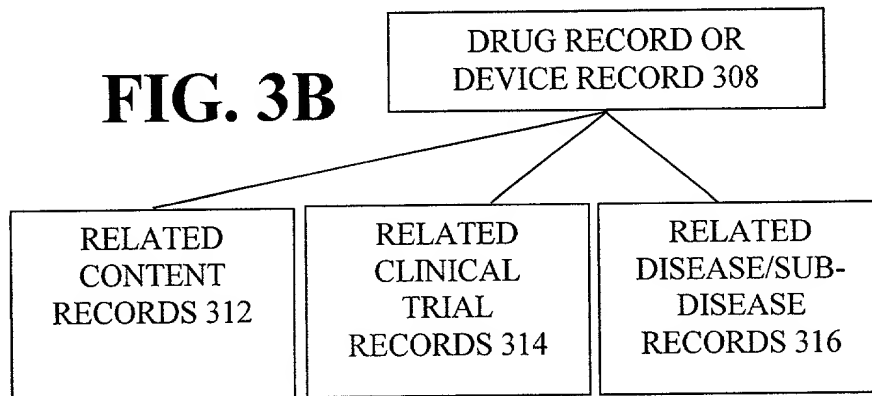


**FIG. 2**

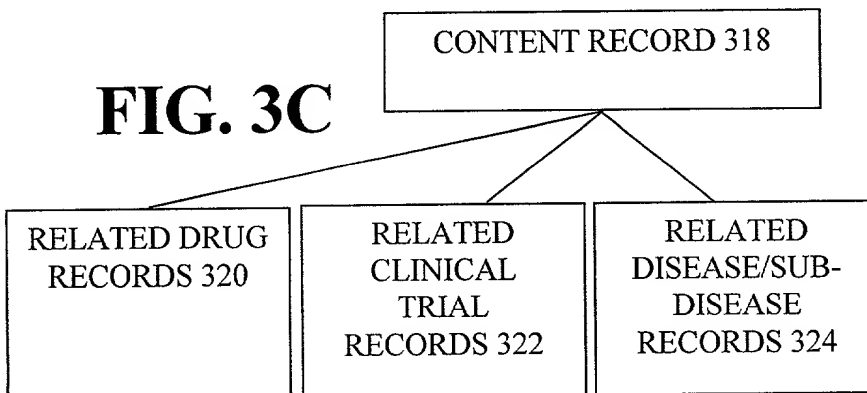
**FIG. 3A**



**FIG. 3B**



**FIG. 3C**



**FIG. 3D**

